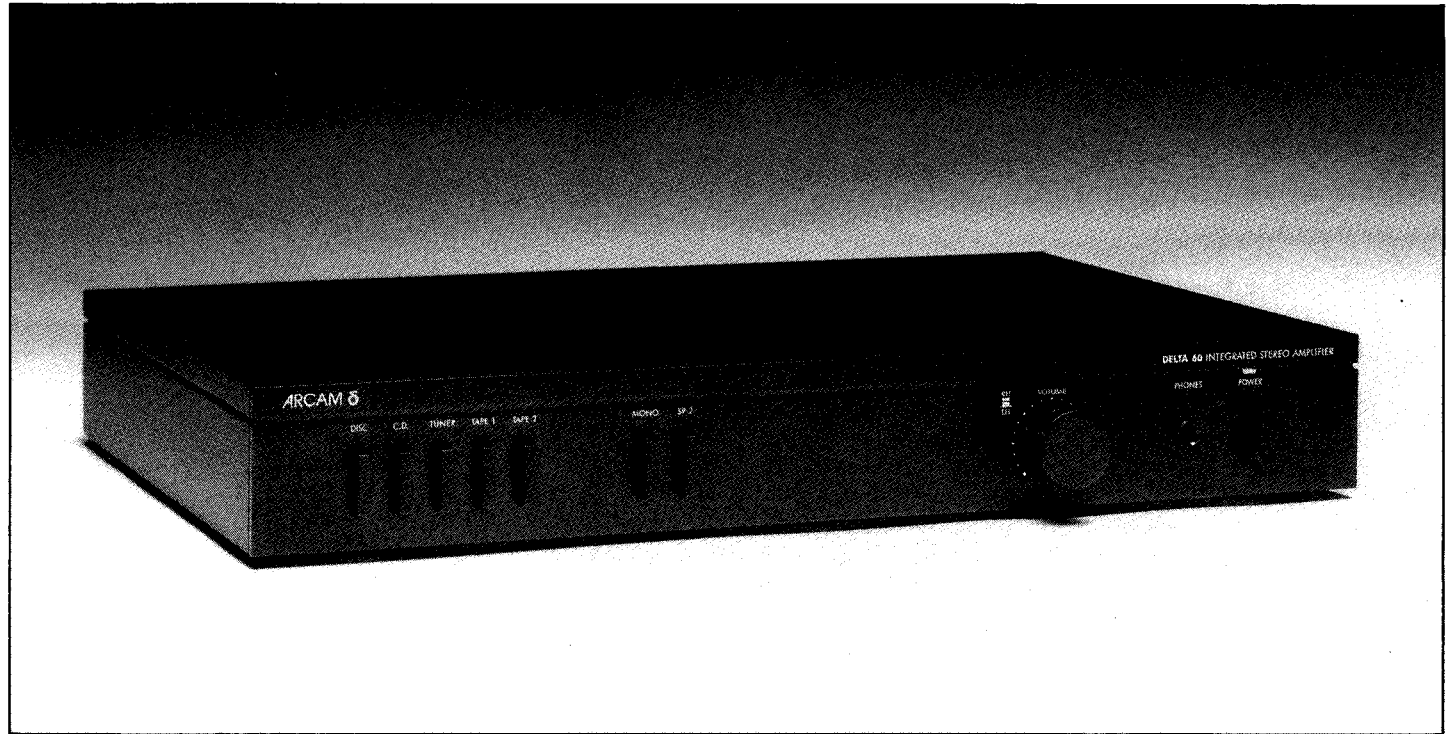


Audiophile products
from A&R Cambridge

ARCAM



Delta 60 integrated amplifier handbook

Introduction

The Arcam Delta 60 integrated amplifier is a product constructed to a purist design, as evident by its lack of tone controls, which will meet the requirements of the most demanding listener. Combining excellent sound quality with sleek, sophisticated styling, the Delta 60 will form the heart of any high quality sound system. It is, of course, ideally suited for use with our existing Delta range units, especially the Delta 80 tuner, Delta 70.2 CD player and Black Box D/A converter.

The Delta 60 has five switchable inputs accepting signals from compact disc, turntable (with facilities for moving magnet and moving coil cartridges), tuner and two tape recorders. The Delta 60 offers further versatility by providing outputs for headphones and two sets of loudspeakers and by allowing mono operation.

Please study these instructions carefully to ensure that you get the best from your Delta 60. Remember that your dealer is there to help you. He has full knowledge of all Arcam products and considerable experience of their use in a variety of systems. If, however, he is unable to answer your query then please contact us at the factory.

Installing and using your Delta 60 Amplifier

Mains supply

The Arcam Delta 60 may be supplied to work on any of the following AC voltages: 110/220V and 120V/240V (100V units can be supplied to special order). Check that your local mains supply voltage agrees with the voltage setting indicated on the back panel of the Delta 60. If not, please contact the factory or your national distributor for details of how to proceed further.

A detachable mains lead is supplied with the Delta 60. The cores of this lead are coloured in accordance with the following code:

Green and yellow	– Earth
Blue	– Neutral
Brown	– Live

Note: Export units for certain markets have moulded mains plugs fitted as standard.

As the colours in the mains lead may not correspond with the coloured markings identifying the terminals in your plug proceed as follows:

The wire which is coloured green and yellow must be connected to the terminal in the plug which is marked by the letter E or to the safety earth symbol or coloured green or green and yellow. The wire which is coloured blue must be connected to the terminal which is marked by the letter N or coloured black or blue. The wire which is coloured brown must be connected to the terminal which is marked by the letter L or coloured red or brown.

Fuses

If the mains plug is fused fit a 5 amp fuse.

The AC supply inlet to the Delta 60 uses a standard IEC chassis mounting plug.

The IEC line socket on your mains lead and the IEC plug on the Delta 60 are a tight fit; before first using the Delta 60 it is therefore important to ensure that the socket is firmly pushed home into the chassis plug.

Under no circumstances should the Delta 60 cover be removed unless the supply is disconnected at the wall socket.

Notice

1 Please retain the carton and all packaging materials provided with this equipment so that it may be repacked correctly if it ever becomes necessary to transport the unit or to return it for service.

2 If servicing is required then the equipment should be properly packed and returned to the dealer from whom it was purchased. It is essential to include a covering letter giving your name and address and a brief but thorough description of the fault.

Connections

It is advisable that your system be switched off before connecting it up to the Delta 60. This will avoid possible damage to your loudspeakers. At the very least ensure that the volume control on your amplifier is turned down, or an unused input is selected.

Rear panel connections

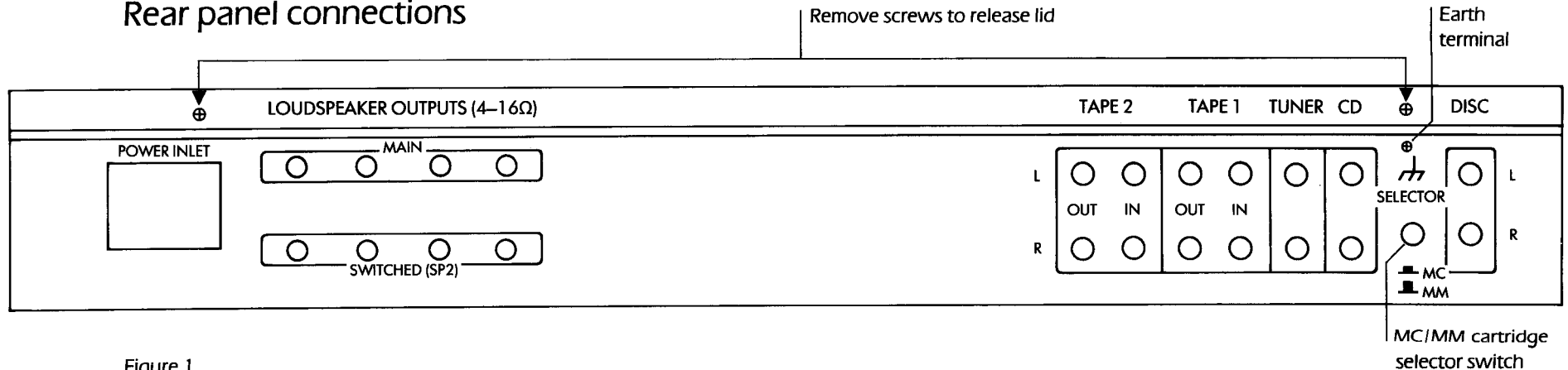


Figure 1

All audio inputs and tape outputs are via RCA phono connectors. All the phono sockets on the Delta 60 are marked 'L' for left and 'R' for right channels, with the left channels nearer the top of the cabinet. Your connection leads will be marked 'L' and 'R' or will have a white or black plug for left and a red plug for right.

Disc input

For the purposes of playing records the Delta 60 can accept both moving magnet and moving coil cartridges. For either type of cartridge the plugs on your turntable lead should be connected to the disc input sockets on the rear panel of the unit. A switch just to the side of these sockets allows the selection of either MM or MC input. The switch should be left out for use with moving magnet or high output moving coil cartridges and depressed for use with normal (low output) moving coil cartridges.

If your turntable has a separate earth lead then this should be attached firmly to the earth terminal on the rear of the amplifier.

Note

NEVER OPERATE THE MM/MC SWITCH ON THE REAR OF THE AMPLIFIER WITH THE VOLUME CONTROL TURNED UP AS THE RESULTANT ELECTRICAL SURGE MAY DAMAGE YOUR LOUDSPEAKERS.

Compact Disc input

This input is suitable for use with any compact disc player (and with our own Delta Black Box D/A converter coupled with a CD Player). Connect your CD player to the amplifier using the phono sockets marked CD.

Note

Although, like the tuner and tape inputs, the CD has a 'flat' frequency response, its sensitivity is lower, to take account of the high output signals generated by CD players. It is possible to use either a tuner or another line source in the CD input but the amplifier's volume control will have to be turned up to obtain a volume similar to that found when using other inputs.

Tuner input

The tuner input is suitable for use with almost any AM or FM tuner. Connect your tuner to the amplifier using the phono sockets marked tuner.

Tape input/output

The Delta 60 has connections for two tape recorders and is suitable for use with almost any cassette, reel to reel or video tape recorder:

1 connect the 'record' leads of your tape recorder to the phono sockets marked 'out' on the rear of the Delta 60 using phono/ phono leads

2 connect the 'playback' leads of your tape recorder to the phono sockets marked 'in' on the rear of the Delta 60 using phono/ phono leads

Loudspeakers

The loudspeaker outputs are suitable for driving loudspeakers in the range 4-16ohms impedance. The loudspeaker output sockets will accept 4mm (banana) plugs. A set of 4 suitable plugs is supplied as standard with the Delta 60. The Delta 60 has two sets of speaker outputs, marked main and switched (SP2). The main outputs, which offer a slightly superior sound quality to the switched, are suitable for use where loudspeakers are to be used alone or where loudspeakers and headphones are to be used at the same time.

The switched (SP2) outputs, in addition to the above, offer the possibility of using headphones only. The switched (SP2) outputs are operated by depressing the SP2 switch on the front panel of the amplifier. When the SP2 switch is depressed the operation of the switched outputs is identical to that of the main outputs. When the switch is out the switched outputs are off, allowing headphones to be used alone.

The switched (SP2) outputs also give the opportunity of using two sets of 8ohm impedance (or higher) loudspeakers with the Delta 60. By connecting one set of speakers to the main outputs and one to the switched and by depressing the SP2 switch on the front of the amplifier it is possible to drive both sets at once.

Loudspeaker connections

1 For both main and switched connections connect the negative side (usually black) of your left hand speaker to the black terminal of the two sockets marked 'L'. The other (the positive side or red) should be connected to the red terminal marked 'L'.

2 Repeat for the right hand loudspeaker.

Heatsink/ventilation requirements

The heat produced by the amplifier is dissipated into the air by the finned heatsink on the rear which will, along with the surrounding panel, become warm while the amplifier is on. The whole back panel may become quite hot if the amplifier is run near full power. *This is perfectly normal.* However, if it becomes too hot to touch, switch off the amplifier at once and consult your dealer. It is very important that there is adequate ventilation for the whole of the amplifier, but especially for the rear. It is also important to remember not to place records on top of it!

Front panel controls

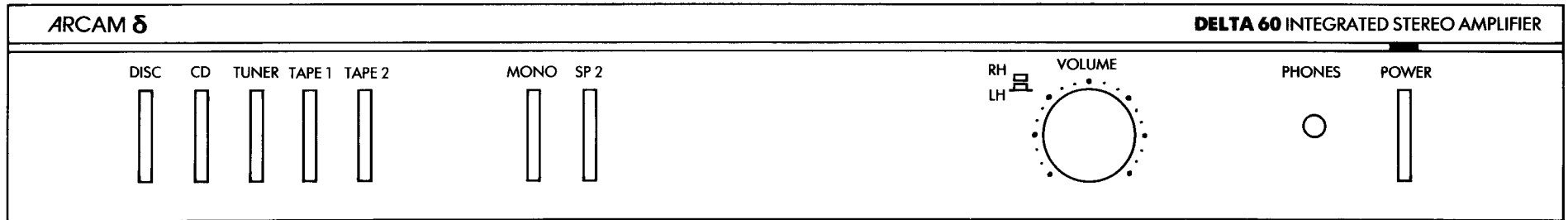


Figure 2

Power switch

The Delta 60 is turned on by depressing the power switch. The small rectangular LED (light emitting diode) above the switch will glow green. After several seconds you may hear a gentle click from inside the amplifier. This indicates that the speaker protection relay has been released and that the amplifier is ready for use. To turn the unit off depress the power switch again so that it unlatches. The green LED, which indicates that the dc power supplies within the amplifier are operating, will continue to glow for a short time after the unit has been switched off as the internal power supplies discharge.

Note

The Delta 60 will play music within seconds of switching on. However, in common with other audiophile products, the internal circuits take some time to stabilise fully and the very best sound quality may not be obtained until the amplifier has had a reasonable time (possibly up to an hour or two) to warm up.

Input selection

The Delta 60's five inputs are selected via 5 rectangular buttons on the unit's front panel. To select the input required depress the appropriate input selector.

Volume control

The volume control is of a split type and allows you to adjust the levels of the left and right channels for both loudspeakers independently. Normally, the two halves of the control knob rotate together as they are locked together by a friction clutch inside the volume control itself. However, by holding the rear part of the control firmly with the first finger and thumb of one hand, it is possible to alter the relative position of the two parts of the knob and thus compensate for level differences caused by the nature of the input signal or due to room acoustics.

Mono

The amplifier is in its normal stereo mode when the mono button is out. In this position, the left and right input signals are amplified independently to feed the corresponding loudspeaker outputs. When the mono button is pushed in the left and right signals are mixed together and the combined signal is routed to both loudspeakers. This is particularly useful when listening to mono records or tapes (as much low frequency out-of-phase rumble can be eliminated) or to remove excessive hiss from FM broadcasts. It is also invaluable for checking speaker phasing in a stereo hi fi system.

Phones

The headphone socket will accept any headphones fitted with a standard quarter inch (6.35mm) stereo jack plug. The headphones may be operated in parallel with the loudspeaker outlets, or not, as you wish (see Loudspeakers above).

Tape recording

The Delta 60 has facilities for two tape recorders. The Tape 1 input is most suitable for use with two head tape recorders and video recorders. The Tape 2 input, in addition to the above, is ideally suited for use with three head tape machines, where tape monitoring is a requirement.

Tape 1 recording

To record an input simply select the required source – either Disc, CD or Tuner – and set your recorder into its recording mode. Note, it is not possible to record signals from the Tape 2 source to Tape 1.

Playback

Depress the Tape 1 switch and set your recorder into the playback mode.

Tape 2 recording/monitoring

All sources, disc, CD, tuner and Tape 1 can be recorded via the Tape 2 connections. To record an input select the required source and set your recorder into the record mode. If your tape machine is a three head type suitable for A/B monitoring then pressing the Tape 2 switch will allow off tape monitoring.

Playback

Press the Tape 2 switch and set your recorder into the playback mode.

Cartridge loading modules

These optional accessories are passive, switchable modules designed to modify the input impedance of the amplifier in order to obtain the best match with the cartridge in use. As the Delta 60 has a single set of disc inputs (switchable to MM or MC via the switch on the rear panel), then two separate loading modules – one for moving magnet (type ULM/M) and one for moving coil (type ULM/C) cartridges – are available on request from your dealer, distributor or the factory. These modules are user adjustable via a series of small switches.

The loading modules should be plugged into the amplifier in the position shown in fig 3. A set of instructions is provided with each module. Care should be taken to ensure that only an MM loading module is used in conjunction with moving magnet or high output moving coil cartridges and that only an MC loading module is used in conjunction with normal (low output) moving coil cartridges.

Under no circumstances adjust the loading module switches when the amp is switched on and the volume turned up as severe damage may occur to your amplifier or speakers.

It must be emphasised that these passive modules mainly affect the sound balance and frequency response. They will have little or no effect on the sensitivity of the amplifier. Most cartridges will perform satisfactorily without any loading module.

Hints and tips

Getting the best from your Delta 60

Connecting cables

When dealing with high quality hi-fi systems, such as those based around a unit with the resolving power of the Delta 60, the question of connecting cables becomes of paramount importance. The higher the resolution of the individual components involved, the higher the chance of some of this hard won clarity being lost in the cables. We strongly recommend that only first class loudspeaker and interconnect cables be used with your hi-fi system. We have found interconnect and loudspeaker cables from the AudioQuest range to be particularly suitable. Detailed information on the AudioQuest range of cables may be obtained from your dealer or the factory.

As a rule of thumb you might budget to spend between 5% and 20% of the price of your system on cable. Surprising though it may seem this can be one of the most effective upgrades you can carry out on your system.

We suggest that you discuss the question of interconnect and loudspeaker cables with your dealer.

Internal Fuses

Loudspeaker fuses

These are 2 amp fast blow 20mm × 5mm diameter in all models. They may blow if the amplifier is:
run continuously at high level into the correct loudspeaker load
run at high level into a loudspeaker of too low an impedance (less than 4 ohms)
run into a short circuit
used to drive two sets of low impedance loudspeakers at once.
They are user-replaceable and two spares are provided.

However, if they blow consistently without any of the above conditions being apparent please consult your dealer. Do NOT replace with a fuse of greater value than 2 amps (or with a 'slow blow' or 'anti-surge' fuse) since this will endanger the amplifier and your loudspeakers and invalidate your guarantee.

Mains fuse

The fuse type is 1.25 amp anti-surge (slow blow) 20mm x 5mm diameter in 220V and 240V models, 2.5 amp anti-surge in 100-120V models. This fuse is designed to protect against faults in the amplifier, transformer and mains switch. It is not user-replaceable. If this fuse blows there is probably a fault, and the amplifier should be returned to your dealer.

Removal of top plate

In order to inspect or change fuses, or to reach the cartridge loading module pins, you will need to remove the top plate from the amplifier.

BEFORE REMOVING THE COVER, ALWAYS SWITCH OFF THE AMPLIFIER AND DISCONNECT FROM THE MAINS SUPPLY.

Note that the mains fuse remains live whenever the amplifier is plugged into the mains, even when the amplifier power switch is in the off position. To remove the top plate unscrew the two black headed screws

at the top of the rear panel using a No. 1 'Pozidriv' screwdriver (see figs. 1 and 3). Then lift the top plate vertically and pull it backwards slightly to release it. Replacement is simply the reversal of this procedure.

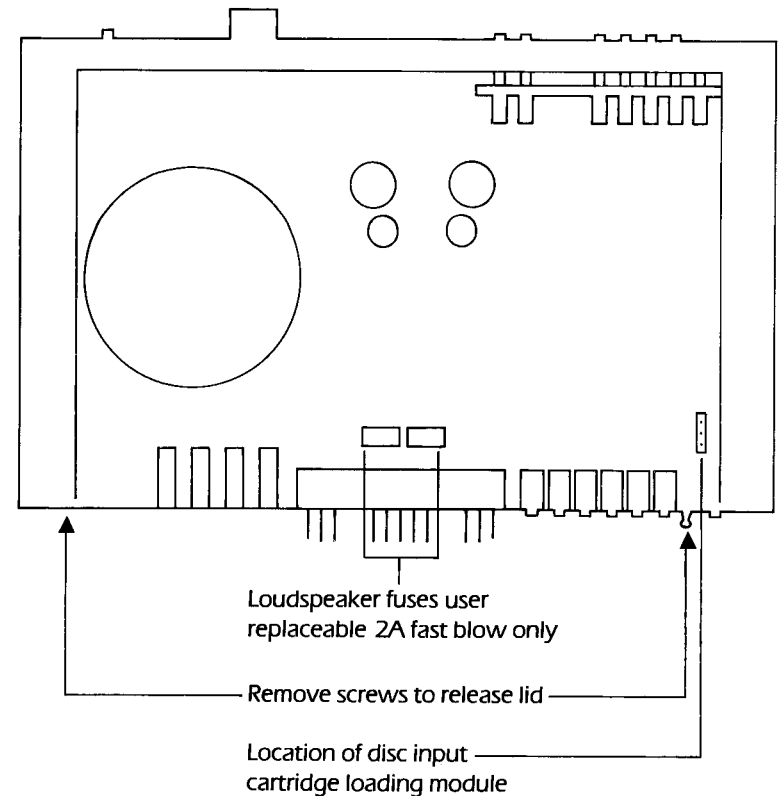


Figure 3

Check list

Should you have any difficulty in operating your amplifier, check the following before suspecting that a fault has developed.

No power and LED not illuminated. Check that:

- 1 the mains supply is connected and that the mains lead is fully home in the mains inlet socket at the rear of the amplifier
- 2 the mains is switched on and that the power switch on the front panel is depressed and has fully latched
- 3 the fuse in the mains plug has not blown and that the mains socket in the wall is live (test with another item/appliance)

Power on and LED illuminated but no output from the amplifier. Check that:

- 1 the amplifier is connected to the desired input and that the correct input on the amplifier is selected
 - 2 the loudspeakers are connected correctly to the amplifier
 - 3 if you have your loudspeakers connected to the outlets marked 'Switched (SP2)', that you have also depressed the switch marked SP2 on the front panel
 - 4 the volume control is not set to minimum
 - 5 if disc is selected, that the cartridge selector switch is set to the correct type of cartridge
- NB *Do not* operate this switch with the volume control turned up
- 6 if CD is selected your machine is playing a CD
 - 7 both speaker fuses have not been blown by a previous user

Power on and LED illuminated but output from one loudspeaker only. Check that:

- 1 both loudspeakers are plugged into the correct amplifier outlets. Note, the amplifier may appear to play in mono if the loudspeakers are inadvertently plugged into the direct and switched outputs of one channel

- 2 both the left and right channels of the selected source are connected correctly and the input wiring is not faulty (check by swapping over the left and right input connectors)

If in doubt contact your dealer

- 3 one section of the volume knob is not set to minimum
- 4 one speaker fuse is not blown

Loud hum heard through loudspeakers when disc is selected. Check that:

- 1 the ground lead from the turntable (if fitted) is connected firmly to the ground terminal on the rear of the amplifier
- 2 the amplifier is correctly earthed via the mains lead
- 3 your cartridge is not sited directly above your amplifier's transformer
(Move the amplifier away and check if the hum level changes).
- 4 other transformers in the vicinity are not radiating into the Delta 60

Loud hum heard through only one loudspeaker when disc is selected. Check that:

- 1 The ground wire is not faulty within the respective channel's lead. This is easily checked by swapping over the leads and checking if the hum moves to the other channel.
- 2 The headshell leads connected to the cartridge on the respective channel are not faulty or loose. If in doubt please consult your dealer.

Technical specification

OUTPUT POWER (typical)

Both channels

8 ohms 55W
(20Hz to 20kHz, 0.5% THD)

Single channel

8 ohms 60W
4 ohms 95W

Peak current delivery

± 10A

Harmonic distortion

50W, 8 ohms, at 1kHz 0.02%

FREQUENCY RESPONSE;

Disc

better than +0.3, -0.5dB from 40Hz - 35kHz,
typ. -3dB at 20Hz

Line

± 0.5dB 30Hz to 35kHz
typ. -3dB at 10Hz, 80kHz

INPUTS

Disc, Moving Magnet

Sensitivity 1.9mV
Noise (CCIR) -76dB
Input impedance 47k ohms/100pF
Overload margin at 1kHz 32dB

Disc, Moving Coil

Sensitivity 190µV
Noise (CCIR) -68dB
Input impedance 220 ohms/4.7nf
Overload margin at 1kHz 32dB

Tuner, Tape 1 + 2

Sensitivity 220mV
Noise (CCIR) ref. 1 W output -84dB
Input impedance 10k ohms
Overload margin at 1kHz 50dB

CD

Sensitivity 360mV
Input impedance 6k ohms

OUTPUTS

Tape 1 and 2

Nominal output 220mV
Output impedance 2k ohms

Crosstalk all inputs 70dB at 1kHz

Power consumption

250VA maximum

Dimensions

430 mm wide
64 mm high
295 mm deep (excluding knobs)

Weight

5 kg Net
6 kg Packed

Guarantee for UK sales

This equipment has been fully tested and a full record of these tests made before despatch from the factory. Both the workmanship and the performance of this equipment are (except as set out below) guaranteed against defects for a period of two years from the date of purchase provided that it was originally purchased from an authorised UK dealer under a consumer sale agreement. (The words 'consumer sale' shall be construed in accordance with Section 15 of the Supply of Goods (Implied Terms) Act 1973).

The manufacturers can accept no responsibility for defects arising from accident, misuse, wear and tear, neglect or through unauthorised adjustment and or repair, neither can they accept responsibility for damage or loss occurring during transit to or from the person claiming under this guarantee.

This guarantee covers both labour and parts and is transferable to subsequent purchasers but the liability of the manufacturers is limited to the cost of repair or replacement (at the discretion of the manufacturers) of the defective parts and under no circumstances extends to consequential loss or damage.

Claims under this guarantee

This equipment should be packed in the original packing and returned to the dealer from whom it was purchased or, failing this, any other authorised Arcam dealer. If it is not possible to return the equipment by hand, then it should be sent carriage prepaid by a reputable carrier.

Should the original packing not be available, replacement packing can be purchased from the manufacturers. The equipment should not be sent by post.

DO NOT CONSIGN THE EQUIPMENT TO A&R CAMBRIDGE UNLESS YOU HAVE FIRST BEEN SPECIFICALLY REQUESTED TO DO SO BY THE MANUFACTURER'S TECHNICAL SERVICE DEPARTMENT. DO NOT UNDER ANY CIRCUMSTANCES ATTEMPT TO DISASSEMBLE THE EQUIPMENT BEFORE DESPATCH.

If you have any difficulty complying with these requirements please contact the manufacturers at the following address.

ARCAM

Pembroke Avenue,
Denny Industrial Centre,
Waterbeach,
Cambridge CB5 9PB, England.

Telephone: (0223) 440964

Fax (0223) 863384

In either case you should state clearly your name and address, the date and place of purchase together with a brief description of the fault experienced.

In the event of equipment being returned which on test is found to comply with the published specification the manufacturers reserve the right to charge a reasonable fee for testing the equipment and for return carriage.

Enquiries

The manufacturers are happy to answer any queries you may have regarding the use of this equipment on the condition that this enquiry is by letter and a stamped addressed envelope is provided. You should state clearly the serial number of the unit, the dealer from whom it was purchased and the date of purchase.

THIS GUARANTEE IN NO WAY VARIES OR REMOVES A PURCHASER'S STATUTORY RIGHTS.

Part No: SH028, April 1992

Printed by Clanpress (King's Lynn) Ltd.